Memorandum

MIAMI-DADE COUNTY

Date: May 13, 2005

To: George M. Burgess
County Manager

From: Kevin T. Lynskey
Assistant Director, Office of Strategic Business Management

Subject: Review of Supplemental Agreement to the Professional Services Agreement for Metrorail Rehabilitation Engineering Services

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At your request, the Office of Strategic Business Management, Performance Improvement Division (OSBM/PI) reviewed a proposed Supplemental Agreement between the County and Washington Group International (WGI). The proposed agreement calls for WGI to provide extensive engineering support, contract management and quality assurance / quality control (QA/QC) during a five year refurbishment program for 136 Metrorail cars; it also requires that WGI perform similar functions for the acceptance of 12 new Metromover vehicles.

Our review, which was conducted under severe time constraints, focused principally on concerns expressed by the Board. These areas of concern include:

- Federal requirements/guidance concerning QA/QC
- Program management models for transit capital projects
- WGI's scope of work
- Cost comparisons

To complete this review, OSBM/PI interviewed representatives of Miami-Dade Transit (MDT), and consulted with by phone representatives of the Federal Transit Administration (FTA), Florida Department of Transportation (FDOT), several transit agencies who have managed rail rehabilitation projects, a number of private engineering firms, and County staff familiar with engineering contracts. (A list of references is provided in Attachment 1.) We also scanned numerous documents relating to the proposed WGI supplemental agreements and the refurbishment solicitation, federal and state guidelines, and comparative studies involving engineering contracts and rates.

As mentioned above, we conducted this review under a time constraint; consequently, our findings lack typical due diligence and should be considered as somewhat preliminary. In summary, OSBM/PI believes that Miami-Dade Transit's (MDT's) proposed quality assurance program strategy well-reflects FTA QA/QC guidance; that our program management model for the rail car refurbishments is appropriate to Miami-Dade Transit; that WGI's scope of work as it relates to quality assurance is supported by federal guidance and comparative research involving similar refurbishment efforts; and that, in several areas involving cost, our methods of validation, albeit cursory in nature, revealed no obvious issues.

FINDINGS

Federal Requirements for QA / QC

FTA regulations require grantees to establish an overall Program Management Plan (PMP), which must

include an in depth Quality Plan covering up to fifteen quality elements. WGI's scope of work is integral to MDT's overall quality management strategy and is consistent with FTA requirements.

The FTA notes in its 2002 Quality Assurance / Quality Control Guidelines that effective quality management systems are essential to the development of reliable, safe transportation assets, and that the lack of such systems precludes federal funding participation. The FTA has identified fifteen quality elements that, depending on the project particulars, should be addressed in the Quality Plan, ranging from design and document control to inspection, testing and quality audits. FTA regulations also stipulate that prime contractors performing design and production work on capital projects submit their own quality assurance plans addressing these same elements. To date, MDT has drafted, and submitted for FTA review, a Program Management Plan and Quality Plan (referred to by MDT as a Quality Assurance Program Plan - QAPP) for the Metrorail rehabilitation and Metromover replacement projects. MDT has also appropriately required all prime contractors on these projects, including WGI, to produce quality plans that conform to the fifteen quality elements.

MDT has been criticized in the past by the FTA for relatively sparse quality programs and is thus directing particular attention to this area. Although MDT has not received federal funding for the Metrorail rehabilitation or Metromover replacement projects, the department continues to seek such funds and, consequently, is adhering to federal requirements and guidelines in carrying out the project.

Program Management Models for Transit Capital Projects

Miami-Dade Transit's organizational model for the rail rehabilitation project is consistent with FTA recommendations and standard industry practice. FTA guidelines note that grantees may use many different organizational structures to carry out capital projects, including the use of multiple contractors as well as in-house staff, in accordance with agency needs and management structure. With regard to QA/QC functions, so long as the required quality elements are sufficiently addressed and the agency exercises an adequate level of QA oversight, varying organizational structures may be acceptable.

Jurisdictions contacted by OSBM/PI for this study used a range of different models: some relied primarily on in-house staff for quality assurance activities; some used mainly contracted personnel; and some utilized a mix of in-house and external resources. Generally, older transit properties with extensively developed fixed guideway systems tend to rely most heavily on permanent, in-house engineering staff for engineering support and quality assurance work. For example, research conducted by OSBM/PI in 2003 identified Boston, San Francisco and Washington D.C. as being highly reliant on in-house staff for construction inspections.

For the rail rehabilitation project, MDT has opted to utilize the design firm to perform most engineering support and contract management activities. The department has indicated that it lacks sufficient in-house technical expertise to adequately perform these functions and that the hiring of additional staff for a one-time project would not be cost effective. MDT staff have also stated that this is a very common approach for rail rehabilitation projects.

One potential disadvantage of this approach is some loss of independent oversight for design quality assurance. This effect is mitigated somewhat under the terms of the Supplemental Agreement by MDT's provision of two resident Quality Control Inspectors during the Metrorail rehabilitation work. However, no such support is contemplated for the Metromover replacement project.

WGI's Scope of Work

WGI's scope of work as it relates to quality assurance is reflective of FTA guidance. Robust quality responsibilities have also been placed in the solicitation for the Metrorail prime contractor, and in the required activities of the firm providing new Metromover cars. MDT also has a limited role, expected to grow over time, relating to quality. Based on federal guidance and our calls to jurisdictions, having quality components reside with each of these entities is standard practice.

In the time allotted and having limited knowledge in this field, it is not within OSBM/PI's capability to suggest how the required quality plans should align. As mentioned previously, the FTA accepts various program and quality management models. They do note, however, that organizational responsibilities should not duplicate efforts or undermine clear authority lines. The FTA will ultimately review the various quality plans and may be able to provide additional assurance that our overall quality strategy is acceptable and organizationally efficient.

As noted above, WGI's responsibilities are broader in scope than QA/QC. The company will also provide extensive engineering support, such as review of drawings and test results, and various contractor management functions including cost and price analysis, contractor claims and payment requests. OSBM/PI believes that the contract management functions are similar in nature to those provided by Dade Aviation Consultants (DAC) at the Airport and that special expertise is required to carry out these functions properly. In previous correspondence with the Board concerning organizational models for transit, the County Manager's Office has consistently recommended management models that used outside expertise for certain specialized functions.

Cost Comparisons

Our review of the proposed WGI Supplemental Agreement costs consisted of validity checks in four areas: the ratio of QA/QC costs to overall project costs; comparative QA/QC costs between refurbished Metrorail vehicles and acceptance of new Metromover vehicles; administrative overhead multiplier; and base hourly billing rates.

Engineering Support and QA/QC Costs

Program management costs, which can include both engineering support and QA/QC, are occasionally assessed in terms of their relationship to overall project costs. The total adjusted WGI contract amount of $17 million represents approximately seven percent of estimated total project costs. A percentage is sometimes used to examine program management soft costs to overall construction costs; fifteen percent is a common rule-of-thumb. However, FTA representatives and other transit providers have indicated that this ratio is not a particularly useful tool for assessing the appropriateness of these costs for refurbishments. More meaningful indicators include staffing levels as they relate to vehicles processed per month, total project hours, and hourly rates.

Optimal staffing levels for engineering and quality control on rail projects vary considerably according to production rates and the relative newness and complexity of the rail technology. Typically, quality control activities are performed at the production plant and again on site at the transit property; therefore, a bare minimum of two QC professionals are required when production and testing is concurrent (one at each location). With very limited comparative data, it was not possible for OSBM/PI to draw clear conclusions regarding the proposed staffing levels for the Metrorail project.

Hourly rates are discussed in the final section.

Metromover Replacement and Metrorail Rehabilitation Costs

A limited comparison of Metrorail rehabilitation, versus Metromover replacement, costs does not reveal obvious discrepancies. Although costs per car are higher for the Metromover ($162,062) than the Metrorail ($98,423), this can be attributed to the relatively small number of Metromover cars (twelve, versus 136 Metrorail cars) and the fixed nature of engineering design and oversight costs, which are independent of the number of cars ordered. The costs of inspection and testing the two systems were nearly identical on a per car basis. Our research indicates this is consistent with industry standards, as similar QA/QC procedures must be followed for replacement and refurbishment projects. MDT staff has also noted that as fully automated, driver-less vehicles, Metromover cars must be subjected to extremely rigorous inspection and testing protocol.

Additionally, MDT anticipates that procurement of the remaining seventeen Metromover cars will be initiated in 2009 using the same design specifications, effectively reducing per car replacement costs.

Administrative Overhead Rates

Hourly rates for professional architectural engineering services are typically comprised of three elements: direct salary cost (or base rate), an allowance for overhead expenses expressed as a multiplier of the base rate, and profit, expressed as a percentage of total expenses. OSBM/PI briefly reviewed the administrative overhead rates and profit percentage used in the WGI contract. We compared them against readily available national data and considerable data available for other County architecture and engineering contracts. As an overall statement, we found them to be within the expected ranges.

Overhead rates include such indirect expenses as facilities, utilities, corporate and administrative support, and insurance, for example. Such rates are typically derived through financial audits and then negotiated on individual projects. The negotiated overhead multiplier in the WGI contract is 168%; this is consistent with national industry norms, which average roughly 170%. A 2004 financial audit of WGI performed by the Florida Department of Transportation (FDOT) calculated an overhead rate of 179% for work done out of a home or branch office of the design firm, and a rate of 110% for work performed on site with the client providing office space and equipment. Most of the work contemplated in the PSA is expected to be completed out of a branch office.

Our research also indicates that the negotiated profit rate of 10% is within acceptable industry standards.

Hourly Billing Rates

Our research indicates that the hourly base rates for various types of engineers and project managers are comparable to those found on similar on-going transportation projects in Washington, D.C. and New York. The proposed rates for these entities, all performing comparable work, appear to constitute the upper tier of transportation engineering services costs. We arrive at this conclusion by comparing the proposed rates to data for a broad range of such services available through the Florida Department of Transportation, a recent survey of national engineering firms, and our conversations with other jurisdictions.

Attachment

c: Pedro G. Hernandez, Deputy County Manager
Roosevelt Bradley, Director, Miami-Dade Transit

References

Transit Organizations

Federal Transit Administration

Florida Department of Transportation

Washington Metropolitan Area Transit Authority

Maryland Transit Authority

Port Authority Trans-Hudson

Massachusetts Bay Transportation Authority

Sound Transit

New Jersey Transit

South Florida Regional Transportation Authority

New York City Transit Authority

Miami-Dade County

Miami-Dade Transit

Miami-Dade Aviation Department

Private Firms

Deltek Systems, Inc.

Attachment 1